R E M A R K S

Counsel for applicants wishes to thank Examiner Liu for the courtesy of the recent personal interview on September 9, 2004. In the interview, counsel for applicants discussed with Examiner Liu the teachings of the present invention as well as those of previously cited U.S. Patent No. 5,675,581 (Soliman).

In the present Office Action, the Examiner has rejected "claims 1-17 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement." The Examiner, however, has agreed to withdraw the §112, first paragraph rejection.

The Examiner has also rejected claims 1-17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention. Specifically, the Examiner indicates that it is unclear where the bit error rate comes from, stating "[t]here is no bits in the receiver power level." Due to an inadvertent typographical error, the claims recite "based on the bit error rate for the receiver power level." The claims should have read -- based on the bit error rate for the received signal ---.

Applicants have amended independent claims 1 and 11. As amended, claims 1 and 11 now recite "responsive to changes in bit error rate and/or frame error rate for the signal received at the base station from the mobile unit, [means for] dynamically adjusting the power level of the desensitization signal based on said bit error rate and/or said frame error rate." As such, it

should be clear that the bit error rate as well as the frame error rate is for the signal received at the base station receiver from the mobile unit. No new matter has been added. The bit error rate as well as the frame error rate is clearly supported by the specification. See applicants' specification on p. 4, line 25- page 5, line 4.

Regarding the rejection that "the bit error rate" should be changed to -- a bit error rate --, applicants respectfully submit that it is proper grammar to use a definite article. Inasmuch as the "bit error rate" (as well as the "frame error rate") is an inherent feature or quality of the received signal, applicants respectfully submit that it is not proper grammar to refer to such features with the use of the indefinite article "a[n]." Indeed, Landis, on page 35 of his book the <u>Mechanics of Patent Claim Drafting</u>, Second Edition, states:

> "If an element by definition inherently includes a certain feature, such feature need not be recited and it is proper to refer, without previous mention, to such feature."

Accordingly, applicants believe claims 1 and 11 to be allowable under 35 U.S.C. §112.

Substantively, in the Office Action, claims 1-3, 5, 7-12 and 14-16 have been rejected under 35 U.S.C. §102(a) as being anticipated by Soliman and Webb. Claims 4 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman and Webb in view of Hall et al. Applicants have amended independent claims 1 and 11 to more clearly distinguish the claimed invention from the prior art. As amended, claims 1 and 11 require "<u>responsive to changes in bit error rate and/or frame error rate</u>

for the signal received at the base station from the mobile unit, [means for] dynamically adjusting the power level of the desensitization signal based on said bit error rate and/or said frame error rate."

Applicants' invention is directed to a method and system for desensitizing the base station receiver. This is accomplished by injecting a so-called "desensitization" signal onto the receive path of the wireless receiver without attenuating the received signal down towards the noise level. This desensitization signal can take a variety of forms, such a broadband noise, a continuous wave signal, a modulated signal or a digital pseudo-random noise sequence. In many cellular communication systems, the power level transmitted by the mobile units is controlled by the serving base station. This is done so that the mobile unit transmits the lowest power level necessary to maintain a good quality link to the base station. However, it may be desirable to reduce the sensitivity of the wireless receiver at the base station so that the base station believes that the mobile unit is farther away that it really is.

Depending on the application or the cellular configuration, wireless communication systems are designed to operate within a target bit error rate (BER) or frame error rate (FER). As the application or the cellular configuration changes due to changes in the operating environment, the target bit error rate as well as the frame error rate typically changes, particularly where a small coverage area (microcell) is embedded within a larger cell (macrocell). In the present invention, the level of desensitization is dynamically adjusted to account for such changes in the operating environment.

In practice, the bit error rate or the frame error rate can be examined to determine the level of desensitization necessary for the mobile unit to maintain a sufficiently high signal power level to ensure a proper boundary handoff. Again, desensitizing the base station receiver by injecting noise results in the mobile unit maintaining a higher power level than it normally would at a handoff boundary to overcome potential interference. The level of the desensitization signal is dynamically adjusted based on the bit error rate or frame error rate, each which is dependent on the cellular configuration or application of the wireless communication system:

> In certain applications, control circuitry 29 can dynamically adjust the desensitization level depending upon a variety of parameters, including frame error rate (FER) and/or the bit error rate (BER) per received signal power level. In this context, dynamically adjust means that the control circuitry 29 can send a control signal to trigger an adjustment based on changing system operating parameters. The BER, FER and/or corresponding received signal level at base stations with overlapping coverage, nearby base stations and/or base stations in soft handoff with a mobile can be to examined to determine the desired desensitization level. For example, for a particular received power level, the system is designed to provide a particular FER, so the control circuitry 29 adjusts the adjustable attentuator 36 to provide the desired level of desensitization. The level of desensitization may be changed due a change in the operating environment; for example, a building may be built next to the base station, a change in the celluar configuration or change in capacity." Applicants' specification p.4:25- p.5:4.

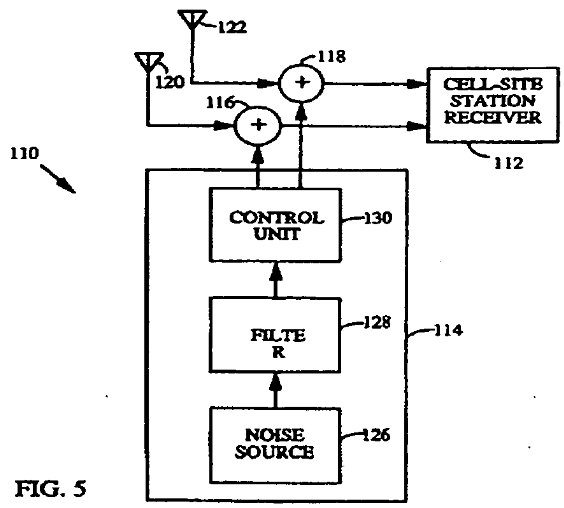

FIG. 5

In contrast to applicants' invention, Soliman discloses a method and apparatus for **simulating** the effect of signal interference by injecting white Gaussian noise in a cell-site station receiver. Referring to Fig. 5 of Soliman, reproduced herein above, a simplified block diagram of the receive section (110) of an exemplary cell-site station is shown. The receive section (110) includes a cell-site station receiver (112) as well as a interference simulation apparatus (114) designed to simulate the maximum interference created by subscriber units in cells proximate the cell in which the cell-site under test is located. The maximum interference signal produced by the simulation apparatus (114) is combined in summers (116) and (118) together with signals received from cell-site station antennas (120, 122), respectively.

The simulation apparatus (114) includes a noise source (126) for generating interference noise of a predefined density. The

noise signal is then passed to control unit (130) and adjusted by an adjustable attenuator to provide the desired amount of maximum simulated interference. Exemplary applications for the simulated interference includes verification of system capacity, testing of power control and evaluation of "handoff" algorithms.

In calculating the amount of simulated interference caused by other users, Soliman assumes that the interference is proportional to the number of simulated users within the cell. Also, the simulated interference is found ostensibly to be indirectly dependent on a specific ratio E_b/N_o (energy per information bit to spectral noise density). More particularly, power fluctuation in the transmitted power of the simulated users is found to be dependent on E_b/N_o. These power fluctuations contribute to the simulated interference of Soliman. When real users or subscribers are already in the cells, Soliman determines the number of equivalent number of users needed by reducing the number of desired simulated users by the number of real users already present.

The Examiner argues that Soliman teaches adjusting the power level of the desensitization signal based on the bit error rate inasmuch as the E_b/N_o is related to the bit error rate. Now, E_b/N_o (energy per bit to the spectral noise density) is simply a measure of the signal noise ratio for the digital communication system. It is used as a basic measure of how strong the signal is. Different forms of modulation, BPSK, QPSK QAM have different curves of theoretical bit error rates versus E_b/N_o. That is, it shows the best performance (BER) that can be achieved for a given amount of power (E_b/N_o).

As amended, however, applicants' claimed invention now requires dynamically adjusting the power level of the

desensitization signal based on the bit error rate and/or the frame error rate for the received signal at the base station. Recall, that as the application or the cellular configuration changes due to changes in the operating environment, the target bit error rate as well as the frame error rate can change. In the present claimed invention, the level of desensitization is dynamically adjusted to account for such changes in the operating environment. This is nowhere remotely taught, shown or suggested in Soliman. As the Examiner has already noted, the noise signal of Soliman is calculated on a specific ratio of E_b/N_o. Inasmuch as this specific ratio is a fixed variable for the desired application and system of Soliman, the injected noise cannot be dynamically adjusted based on the bit error rate (or the frame error rate). This should not be surprising since the problem sought to be solved by Soliman is substantially different than that sought to be solved by applicants.

Applicants inject a noise signal so as to desensitize the receiver, resulting in the mobile unit maintaining a higher power level than it normally would at a handoff boundary to overcome potential interference. As the cellular configuration or application of the wireless communication system changes, typically so does the bit error rate or frame error rate. The level of the desensitization signal is dynamically adjusted based on the bit error rate or frame error rate to account for such changes in the operating environment. In contrast, Soliman simply teaches how to simulate during testing the noise that would be present if a wireless communication were loaded to various capacities. During testing, E_b/N_o, however, is fixed, with the injected noise then calculated based on the **desired simulated loading**. The simulated noise, however, is not dynamically adjusted and reactive to the changes in the bit error rate or frame error rate.

Again, inasmuch as the noise is injected only during simulation, the power level of the noise cannot be dynamically adjusted in response to the bit error rate or frame error rate, with E_b/N_o fixed during the simulation. Indeed, Soliman states that his invention is intended for simulation purposes before network deployment, "[t]he present invention thus enables the performance of a given multiple-access communication system to be evaluated prior to network deployment by simulating level of interference expected to be experienced during normal operation." Col. 3:42-46.

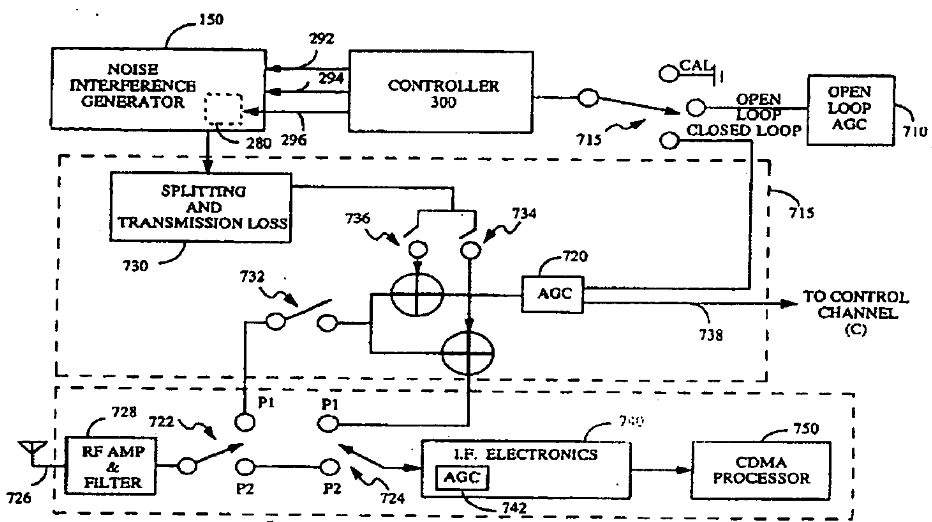

FIG. 9

Also, applicants would like to point out to the Examiner that the noise interference generator of Soliman is not coupled to the cell-site receiver during the normal operation of the communication system. Referring to Fig. 9 of Soliman, reproduced herein above, a noise interference generator 150 is shown with the

cell-site or base-station receiver R1. An interface module 700 having automatic gain control 720 is coupled to switch 715 of an open loop AGC circuit 710. A first voltage produced by AGC circuit 720 is supplied to the look-up table take of digital attenuation values complied during system calibration. Interface module 700 provides for the use of four distinct modes. In the OFF mode, the switch settings are adjusted so as to prevent the noise interference signal from being injected into the receiver. During Calibration mode, the attenuation provided by digital attenuator 280 is varied, with the control voltages produced by AGC circuit 710 on the channel control or test port 738 sampled and recorded. During CLOSED LOOP operation, the values of digital attenuation within the look-up table are used in estimating the power received by antenna 726 of the cell-site receiver. In the OPEN LOOP mode, the interference induced by other subscriber units are simulated, whereas in the Simulation mode, noise is simulated for a desired loading once the number of actual users in the cell has been estimated. See Soliman's specification, col. 3:16 - col. 20:57.

From the above, it should be clear that the noise is injected only during testing, with the noise level dependent on the loading capacity the user wishes to simulate. Although the noise indirectly is calculated from the E_b/N_o ratio, the noise level is not dynamically adjusted in response to changes in the bit error rate and/or frame error rate. It is only incidental that the noise level is calculated from E_b/N_o. Again, Soliman merely attempts to simulate interference for testing purpose. The injected noise is not dynamically adjusted based on either the bit error rate or the frame error rate. Applicants respectfully submit that this is nowhere remotely shown, taught or suggested in Soliman.

Weaver adjusts the noise power level solely when adding or removing a target base station depending on the load on the base station. Neither the bit error rate nor the frame error rate is relevant for Weaver. This should not be surprising since the problem sought to be solved by Weaver is substantially different than that sought to be solved by applicants.

Hall et al. does not cure the deficiencies of the prior art. Hall et al. discloses an "Other User Noise Simulator (OUNS)." Again, in evaluating communication systems it is may be necessary to simulate the noise that would be present if the system were loaded to various capacities. Hall et al. discloses a receiver having an OUNS for effecting such a simulation. However, the noise level is based on simulated load capacity, and based neither on the bit error rate nor the frame error rate. Nor is it dynamically adjusted.

Applicants respectfully submit that their claimed invention as amended is nowhere remotely shown, suggested or taught in either Soliman, Weaver, or Hall et al. Neither references, individually or in combination, suggests applicants' claimed invention.

In view of the remarks above, applicants believe independent claims 1 and 11 to be allowable under 35 U.S.C. §103. Since independent claims 1 and 11 are allowable, it is believed that dependent claims 2-10 and 12-17 are also allowable.

Since this application is believed to be in condition for allowance, reconsideration and allowance are respectfully solicited.

Respectfully Submitted,
Attorney For Applicants

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34,317
John G. de la Rosa (Reg. No.)
375 Upper Mountain Avenue
Montclair, NJ 07043
Tel: (973) 233-0420
Fax: (973) 233-0421